ICD

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/934,249	08/21/2001	Richard T. Lee	P0738/7001 (ERP/KA)	6506

7590 07/13/2004

Elizabeth R. Plumer
Wolf, Greenfield & Sacks, P.C.
Federal Reserve Plaza
600 Atlantic Avenue
Boston, MA 02210

EXAMINER	
LUCAS, ZACHARIAH	

ART UNIT	PAPER NUMBER
1648	

DATE MAILED: 07/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/934,249	LEE ET AL.	
	Examiner	Art Unit	
	Zachariah Lucas	1648	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,8-11,68,80-84 and 86-88* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4, 8-11, 68, 80-84, and 86-88* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 21, 2004 has been entered.

2. Currently claims 1-4, 8-11, 68, 80-84, and 86-88 are pending and under consideration in the application. Claims 1-4, 8-11, 68, and 79-88 were rejected in the prior action, mailed on October 21, 2003. In the Response filed with the RCE, the Applicant amended claims 1, 4, and 80; and cancelled claims 79 and 85.

Claim Objections

3. **(New Objection)** Claim 84 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 9. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See, MPEP § 706.03(k).

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. **(New Rejection)** Claims 8-11, 84, and 86 are rejected under 35 U.S.C. 101 because the claimed invention lacks patentable utility. These claims read on expression vectors for any of the fragments of SEQ ID NO: 1, or complements thereto. However, as is indicated by claim 80, these polynucleotides need not be of any particular length, and may not be sufficiently long to encode an immunogenic polypeptide or fragment of the protein encoded by SEQ ID NO: 1. However, no other uses for such expression vectors are disclosed in the application, and it is not clear why one of ordinary skill in the art would make, or how one of ordinary skill in the art would use, an expression vector for fragments of SEQ ID NO: 1 that do not encode polypeptides of sufficient length to be immunogenic. The claims therefore read on embodiments for which no utility has been provided.

Claim Rejections - 35 USC § 112

6. **(Prior Rejection- Withdrawn)** Claims 1, 8, and 10 were rejected in the prior action under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In view of the amendment of the claims to further define the hybridization conditions, the rejection is withdrawn.

7. **(Prior Rejection- Withdrawn)** Claims 4, 9, 11, 79-81, and 84- 87 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and

distinctly claim the subject matter which applicant regards as the invention. The claims read on isolated nucleic acid molecules consisting of a unique fragment of the sequence of SEQ ID NO: 1, or complements thereto, wherein the fragments includes contiguous nucleotide sequences not identical to any members of a sequence group provided in the claim. The rejection was made on the basis that it was not clear from the application what fragments constituted "unique fragments" according to the claims. In view of the deletion of the language from the claims, the rejection is withdrawn.

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. **(Prior Rejection – Withdrawn)** Claims 3 and 83 were rejected in the prior action under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claims read on nucleic acids encoding MIVR-1 polypeptides having cardiac cell anti-apoptotic activity. This functional language has been deleted from the claims. The rejection is therefore withdrawn.

10. **(Prior Rejection- Restated and Maintained)** Claims 1-3, 8, 10, 11, 82, and 83 were rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not

described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The rejection is extended to cover each of claims 1-3, 8-11, 82-84, and 86. The claims previously read on nucleic acids coding "for a MIVR-1 polypeptide having cardiac cell anti-apoptotic activity." In the Response, the functional language was deleted from the claims, such that they now read on any of the following: nucleic acids comprising (a) sequences that hybridize to SEQ ID NO: 1, (b) degenerate sequences to the sequences of (a), and complements of (a) and (b). The claims also read on expression vectors for those sequences or fragments thereof. While the Applicant has asserted that the sequence of SEQ ID NO: 1 has anti-apoptotic activity, the Applicant has not provided any direct evidence that this is the case. The Applicant asserts that the protein is upregulated in cells that have been exposed to mechanically-induced deformation stress (MIDS), and that cells that are exposed to such stress had decreased in vitro apoptosis in culture. While the Applicant has identified several proteins that were upregulated, the application provides no demonstration as to the function that these proteins perform. Nor is there any evidence in the application or the art that the particular protein encoded by SEQ ID NO: 1 has anti-apoptotic activity. The application provides not additional evidence of protein activity other than up-regulation in cells that have been exposed to MIDS. While the application suggests that the proteins have anti-apoptotic activity, because the Applicant has not presented any evidence or direct correlation between the presence of this specific protein and the reduced apoptosis of the cells in culture, there is insufficient evidence of the cells activity to enable those in the art to use the protein. The information is therefore also insufficient to enable those in the art to use the claimed expression vectors encoding the protein.

Further, the claims as amended do not require either that the claimed nucleic acids encode peptides have anti-apoptotic activity, nor that the nucleic acids contain full length sequences of SEQ ID NO: 1 (or its complements or degenerates) or SEQ ID NO: 3. They include any sequence that can hybridize to SEQ ID NO: 1, or complements thereto, without limitation. Because it is not clear what functions the protein as a whole performs, and because the Applicant has provided no guidance as to what regions of the protein are required for such functions, those in the art would not know what function is being performed by the fragments encoded by the claimed expression vectors. Because those in the art would not know what, if any, function the peptides are capable of performing, they have not been provided sufficient information to use the expression vectors encoding the sequences.

Claims 1-3, 8-11, 82-84, and 86 are therefore rejected for lack of enablement.

11. **(New Rejection)** Claims 1, 3, 4, 68, 80, 81, 87, and 88 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. This rejection is concerned with claims 1, 3, 4, 80, and 88 to the extent that read on fragments of SEQ ID NO: 1 or SEQ ID NO: 3. No function is required for the fragments of the sequence. Further, claim 80 indicates that the fragments may be of sizes including those of down to 8 nucleotides in length. Thus, the claims read on probes for the sequence of SEQ ID NO: 1 or it s complements. Claims 81 and 87 further limit the sequences of claim 4 to embodiments wherein the encoded peptide is immunogenic.

The Applicant has asserted a utility for the protein encoded by SEQ ID NOs: 1 and 3 as whole. However, as was indicated above, the presently rejected claims read on fragments of these sequences that are not required to perform any specific function other than the ability to hybridize to SEQ ID NO: 1. Thus, the claims describing fragments of the sequences read on nucleic acid probes for sequences of SEQ ID NO: 1 or SEQ ID NO: 3. Claims 81 and 87, which require that the sequence encode immunogenic peptides, may be used to produce antibodies to the sequence of SEQ ID NO: 1. Such antibodies may also be used as probes for detecting the proteins in a sample. Thus, each of these sets of claims describes a set of nucleic acids either directly useful as, or useful in the making of, probes for the expression of the protein encoded by SEQ ID NO: 1.

In the specification, such probes are indicated to be useful for determining the expression of the protein encoded by SEQ ID NO: 1. Page 29. The application also asserts that determining these expression levels may be useful for the diagnosis of certain cardiovascular disorders. App., page 35 line 21 through page 36 line 25. However, as was described above, the Applicant has not provided any evidence of the function of the protein encoded by SEQ ID NO: 1. Nor is there any demonstration in the art or the application that the protein encoded by SEQ ID NOs: 1 and 3 is actually up- or down- regulated in cells with the disorders indicated on page 36. Thus, because the Applicant has not provided sufficient information to enable those in the art to use the nucleic acid of SEQ ID NO: 1 (see above), and because the Applicant has not established that the fragments of this sequence would in fact be capable of use in a method for the diagnosis of the indicated disorders, there is insufficient information to enable those in the art to use the fragments thereof. This is because, if those in the art do not know what function the protein

performs or what disorders, if any, the presence of the protein correlates with, then those in the art would also not know how or for what to use the claimed fragments as probes.

12. **(Prior Rejection – Withdrawn)** Claims 4, 9, 11, 79, 80, 81, 84, 85, 86, and 87 were rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. These claim read on "unique fragments" of an MIVR-1 nucleic acid sequence. In view of the amendment of the claims such that they do not read on the rejected genus of inventions, the rejection is withdrawn.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

14. **(Prior Rejection- Withdrawn)** Claim 1 was rejected in the prior action under 35 U.S.C. 102(a) as being anticipated by either Tang et al. WO 00/34477, or by Xu et al., Genomics 66:257-63 (June 2000, Accession number AF224278). In view of the amendment of the claims such that they now require that the stringency conditions in the claims are high stringency

conditions, and because such conditions would require that the percent identity of the sequences exceeds that shared by SEQ ID NO: 1 and the sequence disclosed by Tang, the rejection is withdrawn.

15. **(New Rejection-Necessitated by Amendment)** Claims 1, 4, 68, and 88 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhong et al. (U.S. 20020064771). These claims read on fragments of SEQ ID NO: 1, or complements thereof.

Zhong teaches a sequence (SEQ ID NO: 10) consisting a sequence that is complementary to residues 56-76 of SEQ ID NO: 1. There is support for this sequence on page 13 of the priority document for the publication, U.S. provisional application 60/195852. The reference therefore anticipates the indicated claims.

16. **(New Rejection-Necessitated by Amendment)** Claims 1, 4, 68, 80, and 88 are rejected under 35 U.S.C. 102(e) as being anticipated by either of Matson et al. (U.S. 5,981,185), or Weiner et al. (U.S. 20030026801). These claims describe fragments or hybridization partners of SEQ ID NO: 1, complements thereof, and compositions comprising such sequences. It is noted that claim 1 no longer requires the claimed polynucleotides to encode a polypeptide, or to have any function other than the ability to hybridize to SEQ ID NO: 1 or its complement.

Matson teaches oligonucleotides comprising either a fragment of SEQ ID NO: 1 (SEQ ID NO: 56 of the patent), or complements thereto (SEQ ID NOs: 52 and 55).

Weiner teaches an oligonucleotide (SEQ ID NO: 410) with a sequence consisting of residues 56-75 of the SEQ ID NO: 1 of the present application. Support for this sequence may be found on page 52 of the priority provisional application 60/213,346 at page 52.

These references therefore anticipate the indicated claims.

Conclusion

17. No claims are allowed.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zachariah Lucas whose telephone number is 571-272-0905. The examiner can normally be reached on Monday-Friday, 8 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Housel can be reached on 571-272-0902. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Z. Lucas
Patent Examiner

James C. Housel 7/12/04
JAMES HOUSEL
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600